REMARKS

This is a full and timely response to the non-final Official Action mailed **October 30, 2007**. Reconsideration of the application in light of the following remarks is respectfully requested.

Claim Status:

Claims 19-52 were withdrawn from consideration under the imposition of a previous Restriction Requirement and cancelled without prejudice or disclaimer. Claim 2 is cancelled herein without prejudice or disclaimer. Thus, claims 1, 3-18 and 53-73 are currently pending for further action.

Allowable Subject Matter:

In the recent Office Action, the Examiner allowed claims 17 and 64-72. Applicant wishes to thank the Examiner for the allowance of these claims.

35 U.S.C. § 112, Second Paragraph:

The recent Office Action rejects claims 1-16, 18 and 53-56 under 35 U.S.C. § 112, second paragraph, "as being incomplete for omitting essential structural cooperative relationships of elements, such omissions amounting to a gap between the necessary structural connections." (Action, p. 2). These claims have been carefully reviewed in light of the Examiner's comments.

While Applicant does not necessarily agree that any of these claims were indefinite as filed, the indicated claims have been amended herein to address the issues raised by the Examiner under 35 U.S.C. § 112, second paragraph. Following this amendment, all the

remaining claims are believed to be in compliance with 35 U.S.C. § 112 and notice to that effect is respectfully requested.

Prior Art:

Claims 57 and 58 were rejected as anticipated under 35 U.S.C. § 102(a) or (e) by U.S. Patent App. Pub. No. 2003/0134177 to Furuya ("Furuya"). For at least the following reasons, this rejection should be reconsidered and withdrawn.

Independent claim 57 recites: "A method of forming a fuel cell electrolyte, comprising: disposing a temporary substrate in a solution already comprising polymer units; and electrodepositing said polymer units on said temporary substrate so as to form said fuel cell electrolyte on said temporary substrate."

As will be known to those skilled in the art, a typically fuel cell comprises two electrodes, an anode and cathode, that sandwich an electrolyte between them. Claim 57 recites a method of forming a fuel cell *electrolyte*.

In contrast, Furuya teaches a "method of manufacturing a gas diffusion *electrode* for use as an oxygen cathode in ... a fuel cell." (Furuya, abstract). Thus, Furuya is directed to manufacturing an entirely different component of a fuel cell assembly than is recited by claim 57.

Furuya does not teach or suggest the claimed method of forming a fuel cell *electrolyte* as opposed to an electrode. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). See M.P.E.P. § 2131. For at least these reasons, the rejection based on Furuya of claim 57 and its dependent claim should be reconsidered and withdrawn.

Claims 1-16, 18, 53-63 and 73 were under 35 U.S.C. § 103(a) over the combined teachings of U.S. Patent No. 5,281,327 to Honda et al. ("Honda"), U.S. Patent No. 6,059,943 to Murphy et al. ("Murphy") and U.S. Patent App. Pub. No. 2003/0071259 to Yoshida ("Yoshida") "with evidence from Mesite et al. (US 3,627,859)." (Action, p. 4). For at least the following reasons, this rejection should be reconsidered and withdrawn.

Claim 1 recites:

> A method of forming an electrolyte, comprising:
> removably coupling a perimeter support to a temporary substrate; and
> *electrodepositing a structural material and an electrolyte material to form an electrolyte composite film on said temporary substrate* such that a perimeter of said film is supported by said perimeter support.

(Emphasis added).

Support for the amendments to claim 1 can be found in Applicant's originally filed specification at, for example, paragraphs 0028 and 0029.

Thus, claim 1 recites "electrodepositing a structural material and an electrolyte material to form an electrolyte composite film on said temporary substrate." In contrast, the current Office Action fails to demonstrate how or where the cited prior art teaches electrodepositing all of the multiple components of an electrolyte *composite* film.

Honda does not teach or suggest a method including any electro-deposition. Rather, Honda teaches electro-polymerization. (Honda, abstract). Moreover, Honda only teaches the formation of a polymer layer from monomer components. (Honda, abstract). Honda does not appear to teach or suggest an electrolyte *composite* film comprising both a structural material and an electrolyte material. According to Honda,

> Disclosed is a method of producing a conductive polymer composite comprising a resin layer and a conductive polymer layer formed on the resin layer, which comprises the steps of dissolving, in a monomer component (a) which is polymerizable without condensation reaction, a monomer component (b) capable of undergoing electrolytic polymerization to give at least one conductive polymer and an electrolyte (c), introducing the resulting solution into an electrolytic polymerization cell, applying a

> direct current voltage across the cell to electrolytically polymerize the component (b) to thereby provide the conductive polymer layer, and thereafter subjecting the component (a) to polymerization in the cell to provide the resin layer.

(Honda, abstract).

Thus, Honda teaches the electro-polymerization of monomers already in intimate contact with an electrode rather than any electro-deposition as recited in claim 1. (Honda, col. 2, lines 60-65). Moreover, Honda merely teaches the formation of a polymer layer, not an electrolyte composite film comprising both structural material and electrolyte material as recited in claim 1. Consequently, Honda completely fails to teach or suggest the claimed method including "*electrodepositing a structural material and an electrolyte material to form an electrolyte composite film* on said temporary substrate such that a perimeter of said film is supported by said perimeter support." (Emphasis added).

Murphy, on the other hand, does teach the formation of a composite membrane. (Murphy, abstract). However, Murphy also does not teach or suggest any process that includes electro-deposition. At col. 11, line 63 to col. 12, line 51, Murphy lists "a variety of ways" to make a composite membrane. ***However, none of these methods include electro-deposition.*** Nor has the Office Action argued that Murphy teaches electro-deposition of the multiple components needed to form a composite film as claimed.

The Office now cites Yoshida as teaching that "the deposition of ceramic particles can occur simultaneously with deposition of polymeric particles by an electrophoretic mechanism." (Action, p. 5). This is completely incorrect.

Yoshida relates to electronic paper. (Yoshida, paragraph 0003). Electronic paper is also known as an "electrophoretic display." In this context, "electrophoretic" has absolutely nothing to do with electro-deposition. Rather, in an electrophoretic display device, electrical writing signals are initially applied to the display device to cause each pixel to appear, for

example, light or dark, in accordance with the image to be displayed. After the pixels of the display have collectively achieved the desired appearance, no further power is required to maintain the display of the resulting image. Each pixel corresponds to a cell in the electrophoretic display. In each cell, a quantity of tiny particles is dispersed in a host fluid. In some cases, the liquid host fluid is a liquid crystal (LC) material. The particles are electrically charged and can be manipulated to migrate through the host fluid in response to an applied electric field. This migration of the charged particles will change the optical state or appearance of that cell, for example, causing the cell to appear light or dark. There are different mechanisms that allow the cells to change appearance in response to migration of the charged particles.

Along these lines, For example, Yoshida teaches a

> sheet-like display device described in the item (1), which uses, as a display element used for the sheet-like display function layer, an electrophoretic display device, and wherein a dispersion system containing electrophoretic particles is sealed between the pair of opposing electrode plates at least one of which is transparent, and a distribution state of the electrophoretic particles inside the dispersion system is changed under the operation of a display control voltage applied between the electrodes so as to impart the change to the optical absorption or optical reflection characteristics and to exhibit the predetermined display operation."

(Yoshida, paragraph 0075).

Thus, when properly understood, Yoshida has nothing whatsoever to do with electro-deposition and absolutely does not teach or suggest the simultaneous deposition of ceramic and polymer particles as supposed by the Office Action.

In this regard, the Office Action cites to Yoshida at paragraphs 0345-0346. This potion of Yoshida, in its entirety, reads as follows.

> [0344] A sheet-like display device having another construction and its production example will be explained with reference to FIG. 19.
>
> [0345] The illustrated sheet-like display device comprises a display portion and a power source portion. The display portion has a construction in which a large number

> of microcapsules 203 encapsulating in advance a dispersion system 205, that contains electrophoretic particles 204 dispersed in a dispersion medium, by a microcapsule encapsulation method are interposed between transparent electrodes 202 and 202 formed on the opposing surfaces (ITO vacuum deposition surfaces) of transparent members 201 and 201' formed of a pair of ITO vacuum deposition PET (polyethylene terephthalate) films. An aluminum vacuum deposition layer is formed on the side opposite to the ITO vacuum deposition surface of one 201' of the transparent members. The transparent electrodes 201 and 201' use the electrically conductive organic compound according to the invention.
>
> [0346] Examples of the electrophoretic particles 204 of the dispersion system 205 encapsulated in the microcapsules 203 include ordinary colloidal particles, metal fine particles, organic or inorganic dyes, organic or inorganic pigments, ceramic or glass fine particles, and fine particles of suitable resins and rubbers. Further, these particles can be used in combination, without causing any problem.

(Yoshida, paragraphs 0344-0346).

When read with an understanding of the subject matter that the Yoshida reference addresses, it becomes clear that there is no teaching, suggestion or even a mention of an electro-deposition process here. Moreover, this portion of Yoshida clearly does not teach or suggest the simultaneous electro-deposition of ceramic and polymer particles as incorrectly supposed by the Office Action.

Mesite is cited solely for the teachings the polyvinylidene fluoride "was known to be effect as an electrolyte in fuel cells." (Action, p. 5).

Consequently, none of the cited prior art references teach or suggest a method of forming an electrolyte in which electro-deposition is used to deposit, not just a polymer film, but an electrolyte *composite* film composed of both electrolyte and structural components on a substrate.

Under the analysis required by *Graham v. John Deere*, 383 U.S. 1 (1966) to support a rejection under § 103, the scope and content of the prior art must first be determined, followed by an assessment of the differences between the prior art and the claim at issue in view of the ordinary skill in the art. In the present instance, as demonstrated above, the scope

of the prior art, as evidenced by Honda, Murphy, Yoshida and Mesite, did not include the claimed method of forming an electrolyte including "electrodepositing an electrolyte *composite* film on said temporary substrate." (Emphasis added). There is no teaching in the cited prior art of electrodepositing the multiple components of a *composite* electrolyte film as recited in claim 1.

Moreover, Applicant's specification describes at length the advantages provided by this significantly different claimed method. For example, "because the above-mentioned process forms the polymer electrolyte material while in an aqueous solution and with little application of heat, the likelihood of dehydration of the polymer electrolyte is reduced. This reduction in the likelihood of dehydration of the polymer electrolyte may reduce the detrimental impact of the re-hydration process of the MEA during operation, specifically in regards to electrolyte layer adhesion, overall mechanical integrity, and susceptibility to fuel crossover." (Applicant's specification, paragraph 0035).

Consequently, because Applicant's claimed method in claim 1 is outside the scope and content of the prior art and provides advantages not recognized or available in the prior art, Honda, Murphy, Yoshida and Mesite cannot support a rejection of claim 1 under § 103 and *Graham*.

In other words, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974)." M.P.E.P. § 2143.03. Accord. M.P.E.P. § 706.02(j). Because none of the cited prior art references teach or suggest electrodepositing the multiple components of a *composite* electrolyte film as recited in claim 1, the rejection of claim 1 and its dependent claims should be reconsidered an withdrawn.

Additionally, various dependent claims recite subject matter that is further patentable over the teachings of Honda, Murphy, Yoshida and Mesite. Specific, non-exclusive examples follow.

Claim 3 recites "wherein said electrolyte material comprises perfluorosulfonate ionomer particles." The recent Office Action fails to indicate how or where the cited prior art teaches this subject matter. For at least this additional reason, the rejection of claim 3 should be reconsidered and withdrawn.

Claim 9 recites "wherein said metallic material comprises nickel." In contrast, the cited references do not appear to teach or suggest this subject matter, nor has the Office Action cited such a teaching in the cited prior art. For at least this additional reason, the rejection of claim 9 should be reconsidered and withdrawn.

Claim 11 recites "wherein removably coupling said perimeter support comprises depositing a release material on said temporary substrate prior to electrodepositing said electrolyte composite film." The recent Office Action concedes that the cited prior art fails to teach the claimed depositing of a release material. (Action, p. 6). However, the Action nevertheless concludes that the subject matter of claim 11 is obvious in view of the cited prior art. (*Id.*).

Applicant notes that the Office Action has not indicated where the cited prior art teaches removing a film or membrane from the substrate on which it was formed. Consequently, there is no apparent need in the prior art for the claimed release material. Thus, the Office has failed to demonstrate any teaching of the claimed release material or any need in the art that would lead to the use of the claimed release material. For at least these additional reasons, the rejection of claim 11 should be reconsidered and withdrawn.

Claim 12 recites "electrodepositing a layer of ions on said electrolyte composite film." This concept is not taught or suggested by the cited prior art. Moreover, the recent Office Action does not appear to address claim 12 or to explain how or where this subject matter is taught by the prior art. For at least these additional reasons, the rejection based on Honda of claims 12, 13, 15 and 16 should be reconsidered and withdrawn.

Claim 14 recites "wherein said layer of ions comprises at least one of perfluorosulfonate ionomers or sulfonate polyetherketones." The recent Office Action fails to indicate how or where the cited prior art teaches this subject matter. For at least this additional reason, the rejection of claim 14 should be reconsidered and withdrawn.

Claim 18 recites "wherein electrodepositing said electrolyte composite film comprises electrophoretic deposition and electrodepositing said layer of ions comprises electrolytic deposition." The recent Office Action fails to indicate how or where the cited prior art teaches this subject matter. For at least this additional reason, the rejection of claim 18 should be reconsidered and withdrawn.

Claim 53 recites "simultaneously electrodepositing electrolyte particles and structural particles to form a single layer of said electrolyte composite film." As noted above, there is no reference of record that teaches or suggests electrodepositing structural particles along with electrolyte particles to form a single layer of an electrolyte composite film. For at least this additional reason, the rejection of claim 53 should be reconsidered and withdrawn.

RECEIVED
CENTRAL FAX CENTER
JAN 30 2008

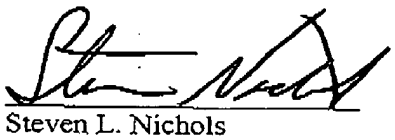
Conclusion:

In view of the foregoing arguments, all claims are believed to be in condition for allowance over the prior art of record. Therefore, this response is believed to be a complete response to the Office Action. However, Applicants reserve the right to set forth further arguments supporting the patentability of their claims, including the separate patentability of the dependent claims not explicitly addressed herein, in future papers. Further, for any instances in which the Examiner took Official Notice in the Office Action, Applicants expressly do not acquiesce to the taking of Official Notice, and respectfully request that the Examiner provide an affidavit to support the Official Notice taken in the next Office Action, as required by 37 CFR 1.104(d)(2) and MPEP § 2144.03.

If the Examiner has any comments or suggestions which could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number listed below.

Respectfully submitted,

DATE: January 30, 2008



Steven L. Nichols
Registration No. 40,326

Steven L. Nichols, Esq.
Managing Partner, Utah Office
Rader Fishman & Grauer PLLC
River Park Corporate Center One
10653 S. River Front Parkway, Suite 150
South Jordan, Utah 84095
(801) 572-8066
(801) 572-7666 (fax)

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being transmitted to the Patent and Trademark Office facsimile number 571-273-8300 on January 30, 2008. Number of Pages: 21

Carla Jones